CalPERS
California Public Employees' Retirement System
Investment Office
P.O. Box 2749
Sacramento, CA 95812-2749
TTY: (916) 795-3240
(916) 795-3400 phone
www.calpers.ca.gov

Agenda Item 7b

September 12, 2011

TO: MEMBERS OF THE INVESTMENT COMMITTEE

I. SUBJECT: Risk Management Quarterly Update

II. PROGRAM: Total Fund

III. RECOMMENDATION: Information

IV. ANALYSIS:

Introduction

The purpose of this item is to provide a quarterly report on Total Fund investment risk to the Investment Committee (the Committee). The format of this item is consistent with the previous quarterly update with the addition of a new risk measure for valuation. In addition, staff has responded to a request from the Committee by including risk trend graphs in Attachments 2 and 3.

Information is presented as of June 30, 2011 and is based on the traditional asset class structure. The new asset class structure was effective July 1, 2011 and will be incorporated in the December 2011 risk report as part of the new risk management system.

Macro Risks

1. **Growth Risks**
In the June 2011 Risk Management Quarterly Update, staff indicated that US and World GDP forecasts were coming down based on slowing economic indicators and downward revisions 1Q 2011 and that this could pose risks to equity valuations; this trend has worsened since June 2011. In the US, 1Q 2011 GDP was adjusted down from 1.8% to 0.3% and 2Q 2011 GDP was 1.3% resulting in a weak 0.8% in the first half of 2011 GDP. The forecast for 2011 US GDP has come down to 1.8% and World GDP forecasts have been lowered to around 3.9%.

Forecasts for 2012 are also being revised down. Higher oil prices in 4Q 2010 and 1Q 2011 is estimated to have clipped US growth by nearly 1% in the first half. The negative economic picture caused a sharp correction in global equities in August 2011 with the S&P 500 down nearly 17% and MSCI World Index by a similar amount. The re-emergence of the Euro debt crisis also contributed to the negative sentiment and flight from risky assets. Advanced economies face decelerating growth, high debt burdens and limited policy options. Since the CalPERS portfolio has high exposure to growth assets, the slowing of GDP growth poses a high risk.

2. **Inflation**
   Inflation (CPI) rose to 3.6% in July, although it is likely to come down with the drop in oil prices. Rising inflation is a significant risk to the CalPERS portfolio.

3. **Euro Debt Crisis**
   The markets are increasingly pessimistic that the Euro debt crisis will be resolved. Default risk indicators (credit default swaps) have widened out significantly to now include Italy in addition to the peripheral countries. Italy is the biggest bond market in Europe, hence the magnitude of the crisis seems to be expanding and has the potential to destabilize the markets.

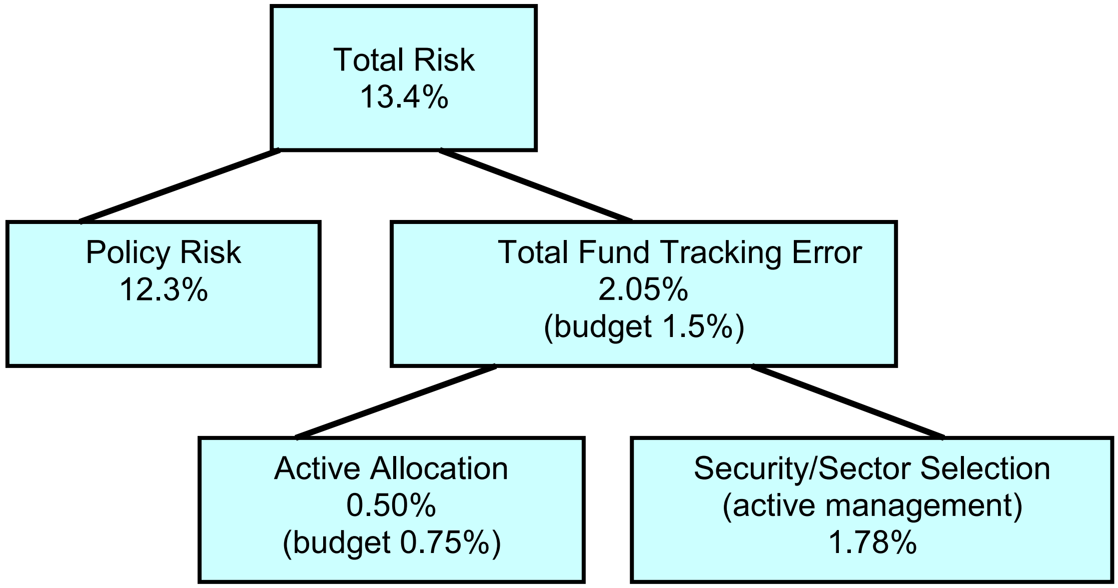
4. **Liquidity Risks**
   A sharp correction in risky assets combined with a credit squeeze could pose liquidity risks reminiscent of the 2008 financial crisis. Staff believes that a number of steps taken recently have minimized this risk.
   a. A liquidity portfolio consisting of short and long maturity US Treasuries with a 4% allocation was implemented in July 2011. US Treasuries have rallied in the latest market correction and served as a hedge against market risks.
   b. The securities lending reinvestment portfolio is much smaller in size and also has a lower leverage limit compared to the cash collateral.
   c. Unfunded commitments in private equity and real estate are at $22 billion, nearly half the size in 2008, but still sizable as a claim on liquidity.

The most significant risk in the CalPERS asset allocation is the equity risk estimated to be nearly 90% of total risk. Lower growth and higher inflation will have material impact on equity returns should they persist. Downside risk appears to be significant despite the recent correction. The actual asset allocation of the PERF is 2.7% underweight in equities, at present.

<u>Risk Measures</u>

Total Fund Volatility (Forecast as of June 30, 2011)
Attachment 1 presents CalPERS Forecast Total Risk as of June 30, 2011 for the Total Fund.

CalPERS Total Fund Risk



The above chart shows the projected volatility (standard deviation) for the Total Fund, currently at 13.4%. That total risk amount is composed of two components: policy risk and Total Fund tracking error.

Policy risk assumes that the Total Fund is invested in the policy benchmark, and is currently forecast to be 12.3%. Forecasts of total risk and policy risk beginning 2005 are presented in Attachment 2. Both measures peaked in early 2009 when the risk model fully incorporated volatility from the fall 2008 market crisis. Market volatility has generally declined since that time until the most recent concerns about the Europe debt crisis and U.S. debt ceiling negotiations. Volatility, as measured by the volatility of the S&P 500 index (VIX), has increased from approximately 20 in July 2011 to over 40 in August 2011.

Total Fund tracking error is the expected volatility of active returns between the Total Fund and the policy benchmark and is currently forecast to be 2.05%. Forecasts of Total Fund tracking error and active allocation tracking error beginning 2005 are presented in Attachment 3. These measures also peaked in 2009 and then declined. The current forecast is above the Total Fund risk budget of 1.5%, however, it is a significant decline from the prior quarter’s value of 2.46%.

Total Fund tracking error is composed of two components: active allocation and security/sector selection. Diversification allows the total amount (2.05%) to be less than the sum of the components (0.50% and 1.78%). Active allocation is the difference in the actual allocation to each asset class compared to the policy allocation. The active allocation risk budget is 0.75%. The current forecast is within budget at 0.5%, and has declined from last quarter's 0.71% value largely due to a reduction in the Global Equity overweight from 3.6% as of March 31, 2011 to 2.9% as of June 30, 2011. This overweight was eliminated with the implementation of the new strategic asset allocation on July 1, 2011. The selection component (1.78%) decreased 28 basis points from the previous quarter, and is determined by active security selection decisions as well as sector or strategy bets. The decline in both of these components contributed to the overall decrease in forecast Total Fund tracking error. These active decisions are summarized at the asset class level in Attachment 4.

Total Fund Asset Allocation vs. Risk Allocation
Attachment 5 compares the actual asset class allocation to the asset class risk contribution (allocation to Total Fund forecast volatility). Global Equity and AIM contribute a greater percentage to the overall risk of the Fund than their actual allocation. In contrast, Global Fixed Income and the Cash holdings contribute less risk than their allocation, thus they act to reduce the volatility of the Fund. Real Estate and ILAC contribute similar portions to the Total Fund risk as their allocations.

Total Fund Volatility Trends

	Policy Limit	**Current** June 2011	**Last Qtr** Mar 2011	**Last Year** June 2010	**3 Years Ago** June 2008
Total Risk	Not applicable	13.4%	14.3%	16.1%	8.6%
Policy Risk	Not applicable	12.3%	12.8%	15.2%	8.0%
Total Fund Tracking Error	< 1.5%	2.05%	2.46%	1.94%	1.08%
Active Allocation	< .75%	0.50%	0.71%	0.68%	Not available
Security/Sector	Not applicable	2.06%	1.78%	1.98%	Not available

Total Fund forecast total risk is 90 basis points lower than last quarter, in line with declining market volatility during the 2Q 2011. Total Fund tracking error also declined.

Asset Class Volatility

	Global Equity	Global Fixed Income	Real Estate	AIM	ILAC	Cash	Total Fund
Total Risk	18.3%	6.5%	17.1%	24.5%	9.2%	0.5%	13.4%
Policy Risk	18.0%	6.3%	13.9%	30.1%	3.7%	0.0%	12.3%
Tracking Error	0.53%	1.73%	5.6%	9.7%	5.8%	0.0%	2.05%

All of the asset classes experienced lower total risk over the last quarter for both the portfolios and the policy benchmarks. This is in line with the general decline in market volatility during the 2Q 2011.

Global Equity continues to have the lowest tracking error of the publicly traded asset classes in line with the benchmark focused strategy. All asset classes experienced lower tracking error, which explains the decline in the Total Fund tracking error due to security and sector selection.

Currency Risk

	Total Risk	Currency Risk Contribution	Tracking Error	Currency Risk Contribution
Risk Measures With Currency Overlay Program	13.4%	1.8%	2.1%	0.4%
Risk Measures Without Currency Overlay Program	13.5%	2.1%	2.5%	0.6%

The above table summarizes the contribution of foreign currency to Total Fund risk both with and without the currency overlay program. The Total Fund benchmark includes the currency overlay program. The currency overlay program, therefore, reduces the contribution of currency holdings to total risk and tracking error. This program offsets some of the currency overweight positions held in the AIM and Real Estate asset classes.

Concentration Measures
The Risk Management Unit monitors Total Fund concentrations across asset classes including country, industry, currency and security asset types compared to the policy benchmark. Concentration measures are reviewed monthly as part

of the Investment Strategy Group risk report package. Current cross asset class industry overweights include capital goods, consumer durables and apparel, and diversified financials. Current industry underweights compared to the benchmark include energy, food beverage and tobacco, and REITs. The largest active exposure to a particular country is an underweight to the US. This is largely due to AIM and Real Estate holding significant international assets while their benchmarks are primarily domestic based.

Leverage
All programs are currently within their leverage limits. Real Estate continues to reduce leverage within that program, having dropped approximately 3% since the last report.

	Leverage Limit	Current Leverage
Global Equity	10%	2.6%
Securities Lending	70%	21.0%
Real Estate	60%	46.7%
Infrastructure	65%	39.9%
Forestland	50%	20.2%

(Further detail is provided in Attachment 6)

Counterparty Exposure
The derivative counterparty exposure report in Attachment 7, summarizes net amounts owed to or due from CalPERS investment counterparties. Amounts are aggregated for currency forwards, options, swaps and TBA securities. TBA are forward settled mortgage-backed securities. Amounts owed to CalPERS result in counterparty risk. As of June 30, 2011, there were no exposures owed to CalPERS requiring collateral postings.

Liquidity
An updated liquidity schedule is included in Attachment 8. Total Fund liquidity as outlined in this schedule is very similar to the schedule presented as part of the March 2011 agenda item. Staff will continue to monitor liquidity and provide an updated report as market conditions change.

Valuation
Valuation is an important component of not just returns, but risk as well, and staff will be providing a discussion around valuation risk going forward. The bulk of CalPERS portfolio risk is related to equities, and will be the focus of this initial observation.

Professor Robert Shiller at Yale University maintains a database of valuation measures and is the source for the raw data that drove the analysis backing our observations. This data covers a range of US instruments and valuations, and includes data on a monthly basis back to 1871. Of particular interest is one metric, referred to as “Shiller PE” which is a cyclically adjusted Price Earnings (PE) ratio, that smoothes out earnings over 10 years. This has the effect of reducing the impact of write-offs and accounting changes, as well as the natural effects of the business cycle on revenues and margins. The key point is that when Shiller PE ratios are high, the future risks are high, and expected returns will be low. It takes years for this effect to play out, and the signal is stronger for identifying rich (and risky) valuations which seem to correct faster than low (and attractive) valuations.

Our analysis has shown that when Shiller valuations are above one standard deviation of their average, returns over the next 5 and 10 years will be poor, with elevated risk. Conversely, when valuations are low, the future returns will be attractive, and risk will be low. We present two histograms in Attachment 9, using both Shiller PE ratios and regular trailing 12 months price earnings ratios. In each chart we have also identified where equity market valuations are currently.

Currently, the regular valuation chart suggests that equity markets are far more attractively priced than they are by the Shiller metric. We believe this is due to a number of factors such as the unusually high current profit margins of corporates, perhaps driven by the unusually low share of wages relative to overall corporate income. If one believes the current high profit margins are sustainable, then valuations are attractive, and are in the 40th percentile relative to all monthly valuations from 1871 onwards. On the other hand, if the Shiller metric is considered more representative of current conditions, then valuations place the market at the 72nd percentile. This is higher than the average valuation, but not yet in the zone which would signal poor future risk/reward ratios. In summary, equity valuations as of mid-August 2011 are not unusually high relative to their prior history.

V. STRATEGIC PLAN:

This item is consistent with Strategic Plan Goal VIII, manage the risk and volatility of assets and liabilities to assure that sufficient funds are available, first, to pay benefits and, second, to minimize and stabilize contributions.

VI. RESULTS/COSTS:

This item provides information to the Committee on the assets and performance of the fund. There are no additional costs associated with this item.

ARVIND RAO
Investment Officer II

TERESA KENNEDY
Investment Officer III

RICHARD ROTH
Senior Portfolio Manager
Risk Management

FAROUKI MAJEED
Senior Investment Officer
Asset Allocation / Risk
Management

JANINE GUILLOT
Chief Operating Investment Officer

JOSEPH A. DEAR
Chief Investment Officer